USER MANUAL

Longo programmable controller
LPC-2.P02 special module

Version 2

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User manual

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STANDARDS AND PROVISIONS: Standards, recommendations, regulations and provisions of the country in which the devices will operate, must be considered while planning and setting up electrical devices. Work on 230 VAC network is allowed for authorized personnel only.
DANGER WARNINGS: Devices or modules must be protected from moisture, dirt and damage during transport, storing and operation.
WARRANTY CONDITIONS: For all modules LONGO LPC-2 – if no modifications are performed upon and are correctly connected by authorized personnel – in consideration of maximum allowed connecting power, we offer warranty for 24 months from date of sale to end buyer. In case of claims within warranty time, which are based on material malfunctions the producer offers free replacement. The method of return of malfunctioned module, together with description, can be arranged with our authorized representative. Warranty does not include damage due to transport or because of unconsidered corresponding regulations of the country, where the module is installed.
This device must be connected properly by the provided connection scheme in this manual. Misconnections may result in device damage, fire or personal injury.
Hazardous voltage in the device can cause electric shock and may result in personal injury or death.
NEVER SERVICE THIS PRODUCT YOURSELF!
This device must not be installed in the systems critical for life (e.g. medical devices, aircrafts, etc.).
If the device is used in a manner not specified by the manufacturer, the degree of protection provided by the equipment may be impaired.

Waste electrical and electronic equipment (WEEE) must be collected separately!

LONGO LPC-2 complies to the following standards:
- EMC:EN 61000-6-2 (EN 50082), EN 61000-6-4 (EN 50081)
- LVD: IEC 61131-2
- Vibrations and climatic-mechanical: EN 60068-2-6, EN 60068-2-27, EN 60068-2-29

Smarteh d.o.o. operates a policy of continuous development. Therefore we reserve the right to make changes and improvements to any of the products described in this manual without any prior notice.

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Longo programmable controller LPC-2.P02 special module

1 DESCRIPTION

LPC-2.P02 control panel special module is used for room temperature regulation.

Controller is equipped with temperature sensor, light intensity sensor and two push buttons: “WARMER - ▲” and “COOLER - ▼”. To increase temperature set point “WARMER” push button is used and to decrease “COOLER” push button is used. Temperature set point command or controller switched off is represented with LED bar-graphs (refer to the Table 3). Light intensity sensor is primary used for LED bar-graph intensity control, so LEDs do not disturb customer during the night if desired.

LPC-2.P02 has many integrated settings and functions which allows adaptation to required system and regulation diagram. Settings can be done and functions can be enabled or disabled using LPC Manager software.

Maximum and minimum temperature set point range can be set to scale temperature set point. Default range is between 18 °C and 24 °C.

If economic function is set, controller will start cooling when room temperature will raise above max. temperature set point and stop when temperature will drop 1 °C below max. temperature set point. On the other hand, when room temperature will fall below min. temperature set point controller will start heating and stop when temperature will raise 1 °C above min. temperature set point.

When four pipe (default) system is selected, controller will activate hot command when heating and cool command when cooling is required. In case of two pipe system selection, hot command is always activated when heating or cooling is required (depends on heating or cooling mode selection). For example that two pipe system, cooling mode is selected and room temperature is higher than temperature set point on the control panel, controller will activate cooling with hot command (cool command is off if heating or cooling is required).

In case that balcony door and/or window function is enabled and door and/or window contact is opened, valves for heating or cooling will be closed.

Frost protection function activates heat command when room temperature measured by the panel drops below 5 °C. This function has priority over all control panel integrated functions.

LPC-2.P02 control panel is possible to switch off using off command is set from LPC Manager software. In this case cool, heat commands are switched off. Cool and heat commands are also switched off when temperature measured by the panel is inside dead band (default = 0.5 °C) temperature values.

Control panel PI regulator output variable range is 0 to 10000. Values from 4999 down to 0 represents cooling and vales from 5000 up to 10000 represents heating.

Example: If proportional – P parameter (default = 25) is set to 1 and difference between measured temperature and temperature set point is +1 °C, the control panel regulator output value will be 5100. On the other hand if the difference is -1 °C, the control panel regulator output value will be 4900.

If integral – I parameter (default = 5) is set to 1 and difference between measured temperature and temperature set point is +1 °C, the control panel regulator output will increase every second by 100. On the other hand if the difference is -1 °C, the control panel regulator output will decrease every second by 100.

LPC-2.P02 is connected to the main control unit RS485 port using interconnection cable (e.g. SIC4-7) which must be ordered together with LPC-2.P02 special module. When more modules (e.g. LPC-2.ID1, LPC-2.ID2, LPC-2.P01 or up to four LPC-2.P02) are connected to main control unit, splitter (e.g. SPL-2) is also required (refer to the Figure 2).

LPC-2.P02 module RS485 address (0..3) is selected through two switches on the back side of the module (refer to the Table 4).

NOTE: For proper system configuration and data allocation please refer to LPC Composer software help menu.

2 FEATURES

Figure 1: LPC-2.P02 special module

Table 1: Technical data
Temperature measurement (room temperature)
2 push buttons for temperature set point
18 LED bar-graph for temperature set point
Light intensity measurement
LED intensity control
Economic function
Two / four pipe heating cooling system supported
Balcony door and window function
Frost protection function
Power LED
Internal fault LED

3 INSTALLATION

3.1 Connection scheme

Figure 2: Connection scheme

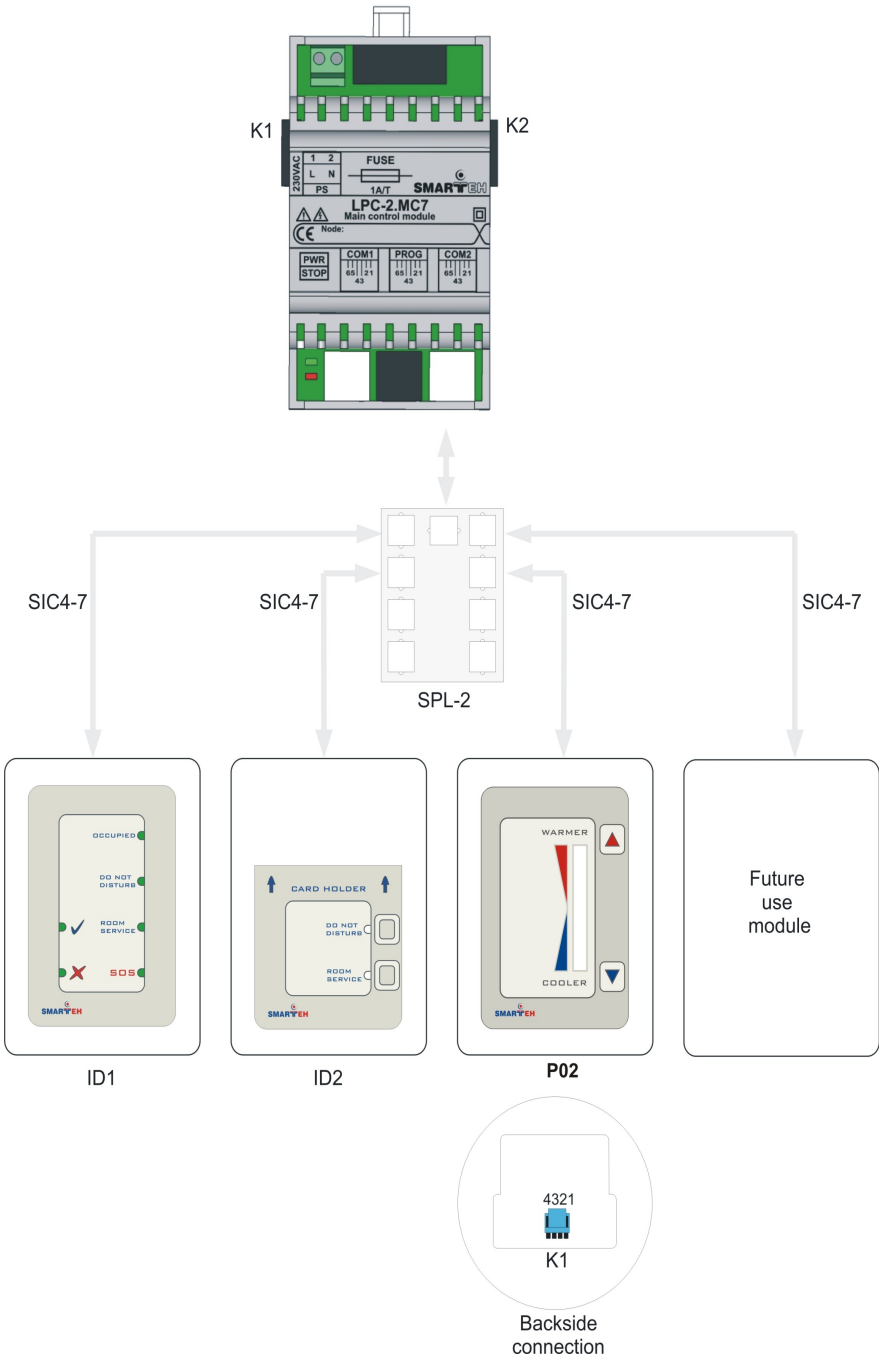


Table 2: K1		
K1.1	GND	Ground
K1.2	9 – 24 VDC	Power supply input
K1.3	Standard RS485 A	Data receive/send line A
K1.4	Standard RS485 B	Data receive/send line B

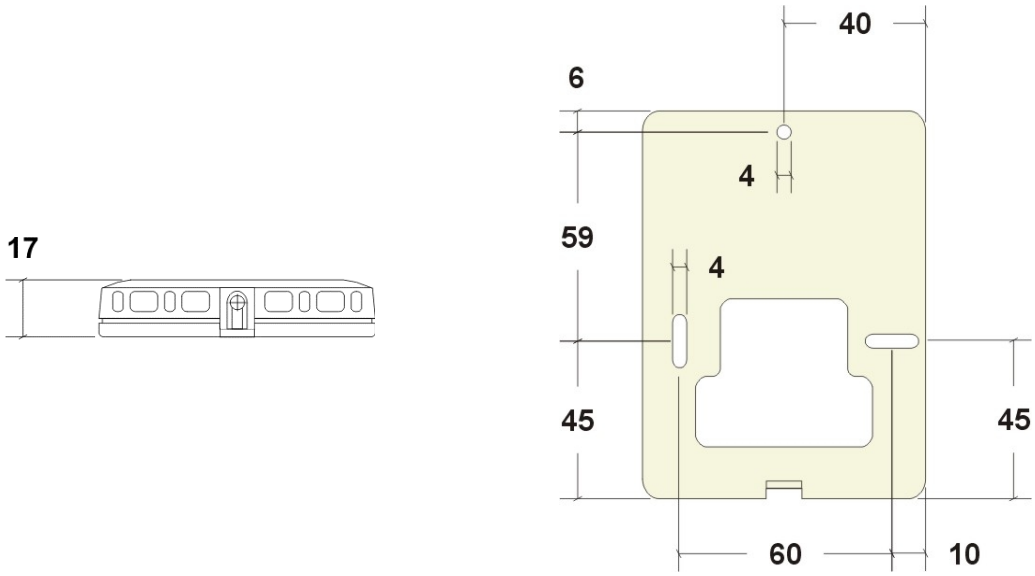
Table 3: LEDs & Buttons		
Power LED (on the upper side of the module)	Green LED: indicates power supply status	On: power supply OK Off: power supply missing or power off
Internal fault LED (on the upper side of the module)	Red LED: indicates communication state	On: RS485 communication fault Off: RS485 communication OK
Temperature set point LED bar-graph	Green LEDs: indicates actual temperature set point between min. and max. Temperature set point range	On: represents actual set point
WARMER	Push button: set point increase command	Set point increased by one step when pressed[1]
COOLER	Push button: set point decrease command	Set point decreased by one step when pressed[1]

Table 4: S1		
RS485 ADDRESS	**Switch 1**	**Switch 2**
0	OFF	OFF
1	OFF	ON
2	ON	OFF
3	ON	ON

1 Each step means 1/12 of pre-setted temperature set point range.

3.2 Mounting instructions

Figure 3: Housing dimensions



- Dimensions in millimeters.

All connections, module attachments and assembling must be done while module is not connected to the main power supply.

The LPC-2.P02 module should be positioned on the wall inside the room. It is advised to avoid direct sunlight or position near heating/cooling source object. Round flush-mounting box (e.g. Gewiss GW 24232), Φ60 mm is recommended for installation. A box must be installed with screw holes in the horizontal position!

Mounting instructions:

1. Mount LPC-2.P02 module back plate to the provided leveled place on the wall.
2. Fasten 2 screws (DIN 7981 or similar, Φ3 mm, **max. head height 3 mm**) to fix LPC-2.P01 module to its place.
3. Connect interconnection cable to the interconnection connector K1. Max. allowed tractive force is 30 N.
4. Set the correct RS485 address (S1 switch) for LPC-2.P02 (refer to the Table 4).
5. Power (PWR) green LED should switch on according to the Table 5.
6. Mount LPC-2.P02 module front plate to the back plate.
7. Fasten the screw in the bottom carefully (not too strong), to fix the front plate to the back plate.

NOTE: LPC-2.MC7 main control module should be powered separately from other electrical appliance connected to LPC-2 system. Signal wires must be installed separately from power and high voltage wires in accordance with general industry electrical installation standard.

3.3 Module labeling

Table 5: Labels

Label 1:

LPC-2.P02
P/N:225P0208001001
D/C: 40/08

Label 2:

S/N: P02-S9-0800000003

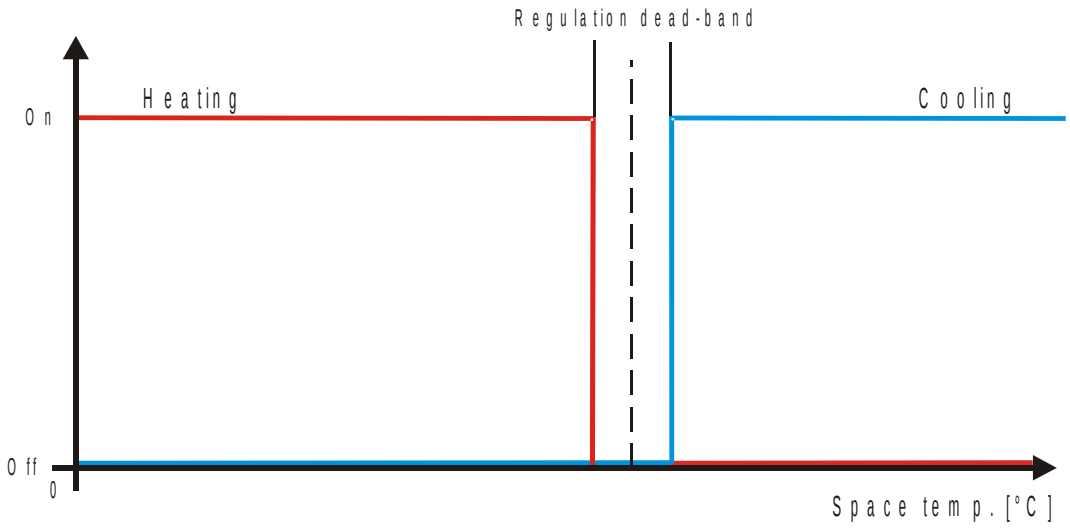
Label 1 description:

1. **LPC-2.P02** is the full product name.
2. **P/N:225P02040001001** is the part number.
   - **225** – general code for LPC-2 product family,
   - **P02** – short product name,
   - **08001** – sequence code,
     - 08 – year of code opening
     - 001 – derivation code
   - **001** – version code (reserved for future HW and/or SW firmware upgrades).
3. **D/C:40/08** is the date code.
   - **40** – week and
   - **08** – year of production.

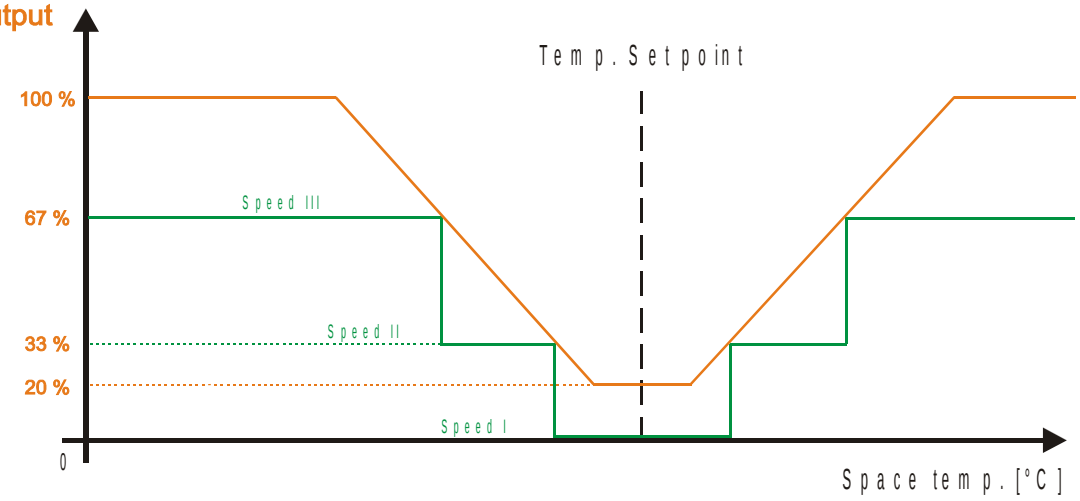
Label 2 description:

1. **S/N:P02-S9-0800000003** is the serial number.
   - **P02** – short product name,
   - **S9** – user code (test procedure, e.g. Smarteh person xxx),
   - **0800000003** – year and current stack code,
     - 08 – year (last two cyphers)
     - 00000003 – current stack number; previous module would have the stack number 00000002 and the next one 00000004.

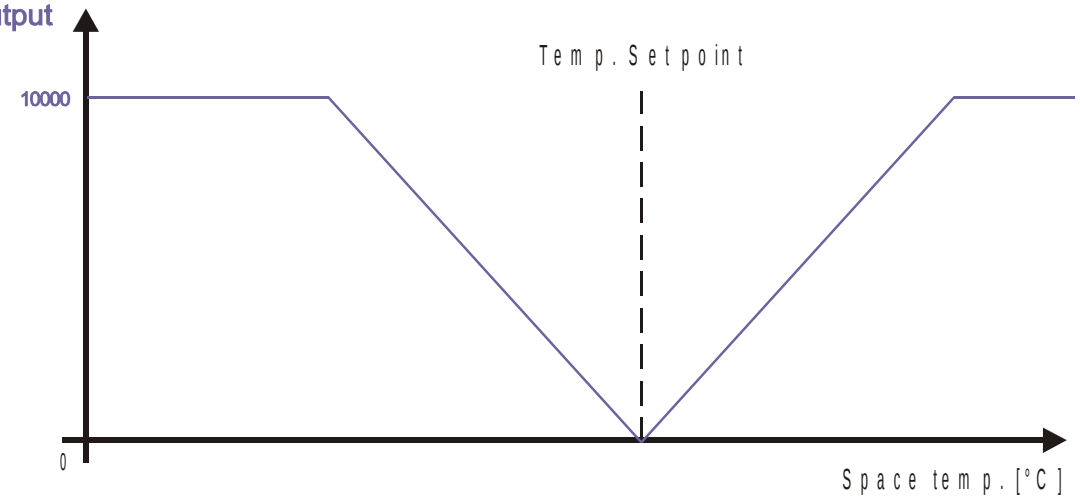
4 REGULATION DIAGRAM



Fan reference output



PI regulator output



5 TECHNICAL SPECIFICATIONS

Table 5: Technical specifications	
Power supply	9 – 24 V from MCU
Interconnection connector type	Berg M
Power consumption	60 mA
Temperature measurement accuracy	±1 °C
Dimensions (W x H x D)	110 x 80 x 17 mm
Weight	80 g
Maximum altitude	2000 m
Mounting position	vertical
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Transport and storage temperature	-20 to 60 °C
Protection class	IP 30

6 PROGRAMMERS GUIDE

Brief description

LPC-2.P02 control panel module is used for room temperature regulation. This module must be connected to LPC-2.MC7 module on COM2. The RS485 address for an P01 module can be set from 0 to 3. The address is set through two switches on the back side of the module. It has many integrated settings and functions which allows adaptation to required system and regulation diagram. Settings can be done and functions can be enabled or disabled through LPC Manager software.

Variables

There are 22 bytes available for reading and writing from/to P01 module. While whole frame of 26 bytes is transferred at a time, LPC Manager variables described in the table below are accessed separately.

VBOOL8 (#N)	
variable	range
Comm. status	0..1
Normal / Economy mode	
Local / Remote status	
Hot valve status	
Cold valve status	
System status	
Change-over function status	
2/4 pipe status	

VBOOL8 (#N+1)	
variable	range
BIT0	0..1
BIT1	
BIT2	
BIT3	
BIT4	
BIT5	
Enab./Dis. balcony status	
Enab./Dis. window status	

VBOOL8 (#N+2)	
variable	range
BIT0	0..1
Normal / Economy command	
Local / Remote command	
BIT3	
BIT4	
Start/Stop command	
Change-over command	
2/4 pipe command	

VBOOL8 (#N+3)	
variable	range
BIT0	0..1
BIT1	
BIT2	
BIT3	
Balcony door status	
Window switch status	
Enab./Dis. balcony door cmd.	
Enab./Dis. window command	

VWORD16 (#N+4)	
variable	range
Max. temperature status [°C/°Fx100]	0..10000
Min. temperature status [°C/°Fx100]	0..10000
P regulation status	0..100
I regulation status	0..100
PI deadband status [°C/°Fx100]	0..10000
WORD6	/
Temperature setpoint [°C/°Fx100]	0..10000
Space temperature [°C/°Fx100]	0..10000
Absolute PI reference	0..10000
Light intensity [%]	0..100

VWORD16 (#N+5)	
variable	range
Max. temperature setpoint [°C/°Fx100]	0..10000
Min. temperature setpoint [°C/°Fx100]	0..10000
P regulation param.	0..100
I regulation param.	0..100
PI deadband parameter [°C/°Fx100]	0..10000
Min. light intensity param. [%]	0..100
Remote setpoint [°C/°Fx100]	0..10000

Accessing P02 module

Read LPC-2 Programmers guide for details.

CHANGES

The following table describes all the changes to the document.

Date	V.	Description
1.7.2012	002	CGP General update.
13.2.2009	001	The initial version, issued as *LPC-2.P02 module UserManual*.

NOTES